

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 4/9/13 at 9:00 a.m.

Objective: Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to reduce adverse effects from Delta operations of the Central Valley Project and the State Water Project on salmonids and green sturgeon. DOSS will work with other technical teams. DOSS notes and advice can be found at: <http://www.swr.noaa.gov/ocap/doss.htm>.

DWR: Kevin Reece, Andy Chu, Edmund Yu, Mike Ford, James Gleim, Tracy Pettit

FWS: Leigh Bartoo, Craig Anderson

NMFS: Barbara Rocco, Bruce Oppenheim, Garwin Yip, Jeff Stuart

Reclamation: Russ Yaworsky

DFW: Bob Fujimura, Krystal Acierta, Robert Vincik, Colin Purdy

SWRCB: Scott Ligare

EPA: Erin Foresman

USGS: not present

Agenda

1. Fish monitoring
2. Current operations
3. Steelhead loss densities for Action IV.2.3 (OMR flows)
4. Tisdale Annual Report 2010–2011

Action: DOSS will wait until the Tisdale report comes out to make a decision on whether to continue to use Tisdale as a monitoring site.

Update: DOSS reviewed the report to consider continuing with the Tisdale location for monitoring as per the requirements of the RPA. Some liked the comparison data between Tisdale and Mouton Weirs and considered Tisdale to be the better monitoring point. DOSS would also like some data on abundance and survival estimates, which might come out later in subsequent reports as stated in the RPA. DOSS agreed to support the Tisdale monitoring station as a permanent additional monitoring station, and will advise WOMT and NMFS.

Fish Monitoring: The following table presents fish monitoring data. Unless otherwise noted, reported sizes are fork length. See also:

<http://www.water.ca.gov/swp/operationscontrol/calfed/calfedmonitoring.cfm>.

Location	Chipps Is. Midwater Trawl	Sacramento Trawls	Mossdale Kodiak Trawl	Tisdale RST	Beach Seines
Sample Date	4/1, 3, 5	4/1, 3, 5	4/2–4/6	4/3, 4, 5, 8	4/1–4/3, 4/5
Total Catch	39	114	260	27	103
FR	1	38	255	14	90
WR	13				
SR	10	68		13	13
LFR	1				
Ad-Clipped Chinook	4	8			

DS	6 (1 w/eggs)				
Splittail	2				
Longfin					
SH (ad-clip)	2		5 (w/sutures)		
SH (wild)					
W. Temp. (avg. °F)	61.0	61.3		59.5	61.7
Flows (avg. cfs)				9,278	
Turbidity (avg. NTU)	31.7	13.8		14.1	14.4
WR/LFR Avg. CPUE					
FR/SR Avg. CPUE				0.17	

Key: FR = Fall run; LFR = Late-fall run; SR = Spring run; WR = Winter run; SH = Steelhead; DS = Delta smelt; LFS = Longfin smelt; CPUE = catch per unit of effort; ACT = acoustic tag; N/A = not available

Tisdale: The traps are checked at 6:00 a.m. and again at 6:00 p.m. for a 12-hour sampling. DFW lets the traps run in the evening and checks again in the morning to determine whether there's a difference between night and day catches. Next week (4/17), there will be a large release of hatchery fall-run Chinook, which might increase the catch. DFW is mainly interested in juvenile spring-run Chinook migration right now, but is still seeing some winter run.

Fish Salvage: Geir Aasen (DFW) provided the fish salvage report covering through 4/7/13 and emailed it to DOSS participants. This report is posted at <ftp://ftp.delta.dfg.ca.gov/salvage> and you can locate the table under folder "DOSS salvage tables" (also try <http://www.dfg.ca.gov/delta/apps/salvage/Default.aspx> and click on "salvage FTP site").

Fujimura (DFW) reported on salvage for 4/1–4/7/13

The number of salvaged steelhead last week decreased compared to the previous week. At the SWP, 57 non-ad-clipped steelhead were salvaged during the reporting period. The CVP is still shut down for maintenance. The estimated daily loss densities ranged from 2.97 to 24.09 fish/TAF and exceeded the first-stage loss criterion (8 fish/TAF) on 5 out of 7 days of the reporting period. The second-stage daily loss density criterion (12 fish/TAF) was exceeded on 4/2 and 4/4; loss densities for 4/5 and 4/6 (11.98 fish/TAF) nearly met the second-stage loss criterion with. The season total of salvaged non-ad-clipped steelhead is 481. Sixty-eight ad-clipped steelhead were also salvaged during the reporting period.

The mean daily loss densities of non-ad-clipped older juvenile Chinook salvaged decreased compared to the previous week. Ninety-six non-ad-clipped juvenile Chinook salmon were salvaged during the reporting period, of which 66 were in the spring-run size range, 8 were in the winter-run size range, and 22 were in the fall-run size range. Daily loss densities of non-ad-clipped older juvenile salmon ranged from 1.02 to 6.04 fish/TAF for 4/1 and 4/6, respectively. The daily loss density for salmon (5.33 fish/TAF) was exceeded on 4/6.

No ad-clipped juvenile Chinook were salvaged during the reporting period and no sturgeon were observed.

Preliminary results for Monday, 4/8/13: Six non-ad-clipped steelhead were salvaged at the SWP. The loss estimate was 25.98 or a daily loss density of 8.99 fish/TAF. Seventy-two non-ad-clipped juvenile Chinook were salvaged, 28 of which were spring run and 44 of which were fall

run. Two ad-clipped winter run were salvaged but the coded wire tags (CWTs) have not yet been read. No sturgeon were salvaged.

Steelhead Exceedance of First-Stage Trigger under RPA Action IV.2.3: Because the first-stage trigger (8 fish/TAF) was exceeded on Monday (8.99 fish/TAF) during the 5-day action response, there still needs to be 3 consecutive days of loss less than or equal to the trigger to relax the action response from the OMR limit of -3,500 cfs to -5,000 cfs OMR flows.

Loss-density and trigger calculations: The steelhead loss density of 11.98 fish/TAF on 4/5 and 4/6 could be rounded up to 12 fish/TAF, but that would not exceed the second-stage trigger (>12 fish/TAF).

There was a lengthy discussion about the use of significant digits, how many to use when doing these types of calculations, and “rounding.” It was generally agreed that rounding to the “10th’s” decimal place from a number that was calculated to the “100th’s”, (*e.g.*, from “5.15” to “5.2”) was adequate; however, some wanted a biological justification for this protocol, given that the trigger itself is a whole number with no decimal, and also given that there could be a significant water loss even at a difference between 0.1 and 0.05 in loss density (*e.g.*, the difference between operating to OMR flows of -3,500 cfs or -2,500 cfs). There was also the question of whether to “round down” when an action trigger was exceeded. For example, would DOSS round from 12.1 to 12, the former of which would exceed the trigger and the latter of which would not? Some believed that once a trigger is exceeded, rounding down does not comply with the intent of the RPA for protecting fish.

It was agreed that when the RPA is amended, NMFS can clarify this protocol; however, until that time, there must be an interim protocol. The intent of the RPA is to protect fish and for DOSS to look at the loss and loss-density numbers to provide advice to WOMT and NMFS. Using a more conservative number (*i.e.*, to the 10th’s decimal place) shows that intent.

There was also discussion about using the actual fish loss instead of loss density, which would provide a value in whole numbers because any decimal would automatically be rounded “up” (you cannot have one-half of a fish, etc.).

It was agreed to bring this up to WOMT and have a discussion and resolution with the WOMT agency managers. It was also agreed that DWR would put together a DOSS subgroup to discuss this issue.

Compiled by Bob Fujimura on April 8, 2013

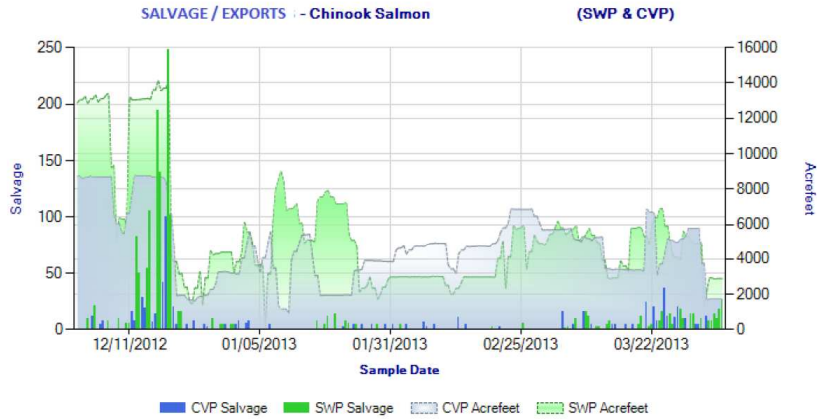


Figure 1. Daily salvage of Chinook salmon (all races) and water exports from the state and federal fish salvage facilities during December 1, 2012 through April 7, 2013. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

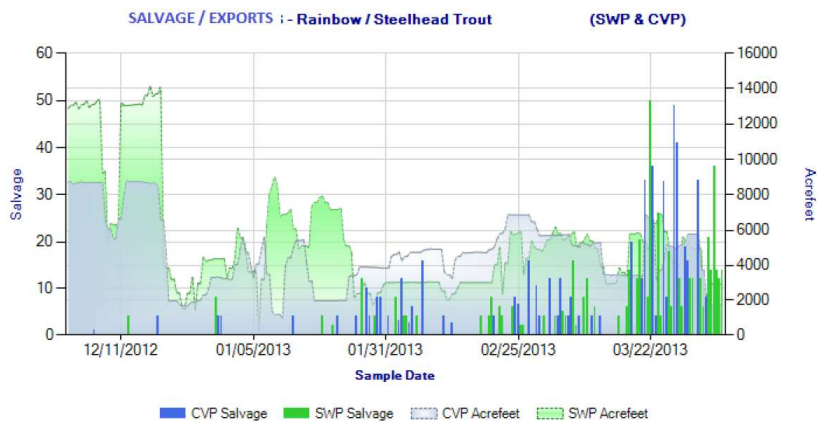


Figure 2. Daily salvage of steelhead and water exports from the state and federal fish salvage facilities during December 1, 2012 through April 7, 2013. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

DOSS Weekly Salvage Update
Reporting Period: April 1-7, 2013
Prepared by Bob Fujimura on April 9, 2013
Preliminary Results - Subject to Revision

Criteria	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	Trend	
Loss Densities									
Wild older/juvenile CS	1.02	0	0	0	0	6.04	0	↘	1.0
Wild steelhead	8.30	19.33	2.97	24.09	11.58	11.98	5.99	↗	12.1
Exports									
SWP daily export	1,414	2,912	2,912	2,876	2,891	2,891	2,891	↘	2,684
CVP daily export	1,717	0	0	0	0	0	0	↘	245

Loss Density = fish lost/TAF; water export = AF; Trend = compared to previous week; wild = adipose fin present
Loss = estimated number of fish lost at the CVP and SWP Delta export facilities based on estimated salvage (see below)

Chinook Salmon Weekly/Season Salvage and Loss
Combined salvage and loss for both CVP and SWP fish facilities
Race determined by size at date of capture; hatchery = adipose fin missing;

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
Wild					
Winter Run	8	20	↘	271	731
Spring Run	66	264	↘	208	595
Late Fall Run	0	0	↗	85	278
Fall Run	22	82	↗	108	289
Unclassified	0	0	↗	8	5
Total	96	366		680	1,898
Hatchery					
Winter Run	0	0	↘	181	566
Spring Run	0	0	↗	0	0
Late Fall Run	0	0	↗	781	2,898
Fall Run	0	0	↗	415	1,522
Unclassified	0	0	↗	0	0
Total	0	0		1,377	4,986

Trend = weekly loss per race; Salvage = estimated number of fish collected by the CVP and SWP fish protective facilities per unit of time

Steelhead Weekly/Season Salvage and Loss
Combined salvage and loss for both CVP and SWP fish facilities

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
Wild	57	247	↘	481	1,278
Hatchery	68	265	↗	531	1,215
Total	125	512		1,012	2,493

State Water Project loss = salvage x 4.33; Central Valley Project loss = salvage x 0.88

Hatchery CWT Results (4/2-4/7, see table below): No change in loss percentages from last week; however, there is still one CWT from 4/8 that needs to be read.

CONFIRMED HATCHERY (ADIPOSE FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2012/2013

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released ¹	Total Entering Delta	% Loss of Number Released ²	% Loss of Total Entering Delta ³	First Concern Level	Second Concern Level	Date of First Loss	Date of Last Loss
11/5/2012	F	Mokelumne River Hatchery	Mokelumne River	**	590.68	100,633	n/a	0.587	n/a	n/a	n/a	12/6/2012	1/20/2013
11/29/2012	LF	Coleman NFH	Battle Creek	Production	4080.78	805,842	n/a	0.506	n/a	n/a	n/a	12/6/2012	1/20/2013
12/18/2012	LF	Coleman NFH	Battle Creek	Spring Surrogate	74.95	72,674	n/a	0.103	n/a	0.5%	1.0%	12/8/2012	3/23/2013
1/8/2013	LF	Coleman NFH	Battle Creek	Spring Surrogate	138.70	79,000	n/a	0.176	n/a	0.5%	1.0%	1/20/2013	3/27/2013
1/25/2013	LF	Coleman NFH	Battle Creek	Spring Surrogate	24.40	85,600	n/a	0.028	n/a	0.5%	1.0%	2/3/2013	3/31/2013
2/7/2013	W	Livingston Stone NFH	Caldwell Park	Production	8.59	182,692	96,525	0.005	0.009	0.5%	1.0%	3/25/2013	3/25/2013

UNCONFIRMED HATCHERY (ADIPOSE FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2012/2013

Facility	Unknown CWT Loss ⁴	Unread CWT Loss ⁵	Unknown Hatchery Loss ⁶	Acoustic Tag Loss ⁷	Number of Unassigned CWTs ⁸
SWP	48.16	0.00	0.00	17.93	1
CVP	5.20	0.00	0.00	0.00	0
TOTAL	53.36	0.00	0.00	17.93	1

SWP and CVP adipose fin clipped Chinook lost from 10/1/2012 through 4/7/2013.

These tables do not account for adipose fin clipped Chinook observed from a special study since salvage and loss for Chinook observed in a special study = 0.

¹Number released with the adipose fin clipped and a CWT.

²% Loss of Number Released = (Confirmed Loss/Number Released)*100.

³% Loss of Total Entering Delta = (Confirmed Loss/Total Entering Delta)*100.

⁴Adipose fin clipped Chinook was observed during fish count, but tag code could not be determined (e.g., damaged tag, lost tag, no tag, or Chinook accidentally released).

⁵Adipose fin clipped Chinook was collected during fish count and has not been processed yet.

⁶CWT has been read, but hatchery release information not yet available.

⁷Adipose fin clipped Chinook released due to presence of sutures.

⁸CWT cannot currently be assigned to a salvage record with certainty since the CWT was lost and then found. CWT may be assigned to a salvage record if new information is available.

** Information not yet available.

DWR/DES Revised 4/9/2013

Preliminary data from DFW, DWR, FWS, and Reclamation; subject to revision.

Operations (4/9/13)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	1,500	Jones Pumping Plant	0 (through 4/14; back online on 4/15)

Reservoir Releases (cfs)			
Feather - Oroville	2,500 (will go down more if DWR is able to conserve water)	American - Nimbus	1,250 (might reduce further later this month after operations forecast is received)
		Sacramento - Keswick	5,800
		Stanislaus - Goodwin	200 (increase to 500 tomorrow, and 750 on Monday, 4/15, as part of NMFS pulse requirement)
Reservoir Storage (in TAF, % of capacity)			
San Luis (SWP)	497	San Luis (CVP)	776 (80)
Oroville	3,037	Shasta	3,843
New Melones		Folsom	636
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	16,684
Outflow Index (cfs)	18,400	San Joaquin River (cfs) at Vernalis	1,515
Total Delta Inflow (cfs)		OMR (daily) (cfs)	-650
Water Temperature (°F)		OMR 5-day avg (cfs)	-296
X2 (km)	73 (west of Chipps)	OMR 14-day avg (cfs)	-2,092
E/I (%)	8.4 (14-d avg)		

DWR is waiting for a determination of the final X2 days needed for Chipps Island D-1641 requirement, but 4 days have been carried over from March. As of yesterday, DWR has 7 days from April for a total of 11 days. Projections for this month are 19 or 20 days of compliance needed at Chipps Island. Outflow is in compliance and daily EC is good. DWR might have a better perspective by next week.

Smelt Working Group (SWG): SWG met on Monday and agreed that given the present distribution, salvage, and Delta conditions, the risk of entrainment remains low and no changes in operations are necessary. No specific OMR flows were recommended. SWG is waiting for a determination from FWS later today.

DOSS Advice to WOMET and NMFS: DOSS advises WOMET and NMFS that the projects are still implementing the action response for the first-stage trigger for Action IV.2.3, which requires OMR flows of no more negative than -3,500 cfs. DOSS is currently monitoring both salmon and steelhead loss densities. The preliminary steelhead loss density for Monday, 4/8, is 8.99 fish/TAF, which is still above the first-stage trigger of 8 fish/TAF for steelhead. The loss density must be <8 fish/TAF for 3 consecutive days to end the action response.

DOSS also advised that the Tisdale rotary screw trap monitoring location meets the requirements of the NMFS BiOp for a new location and can continue to provide fish monitoring data to DOSS.

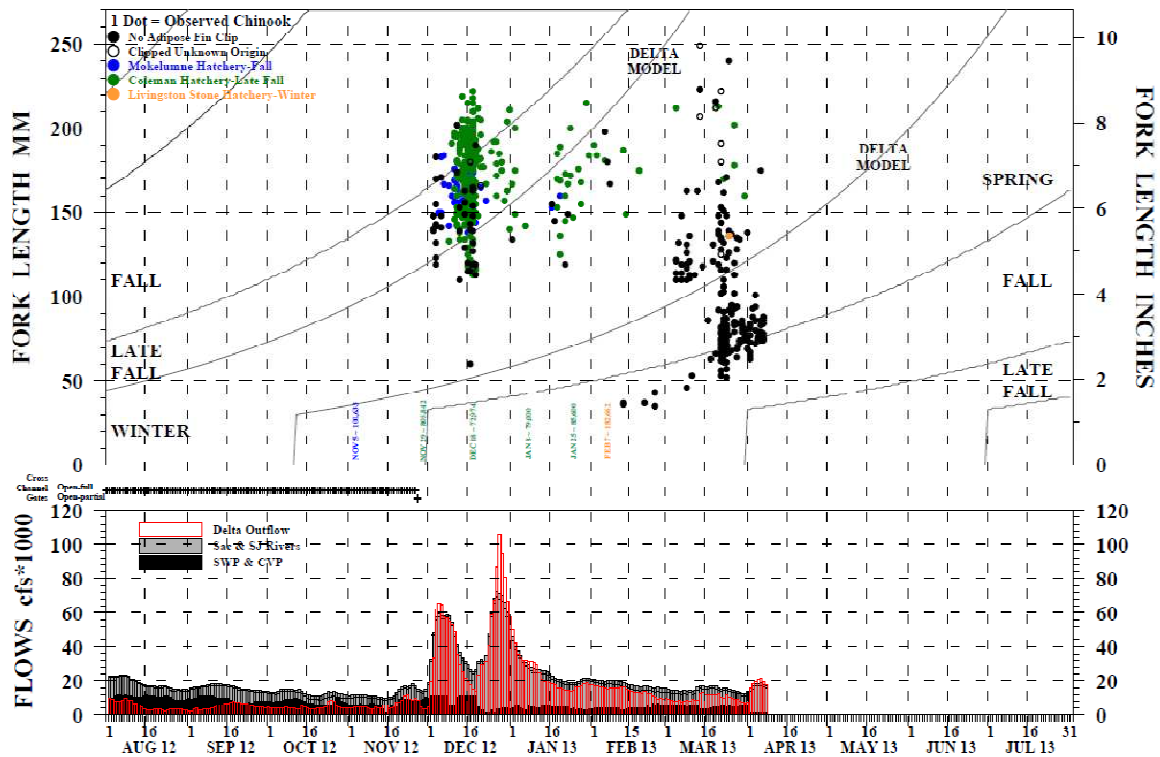
DOSS will also update WOMET that it could not agree on a procedure for rounding the loss-density calculations in the first- and second-stage triggers of Action IV.2.3, and will request that

WOMT resolve the issue. In addition, DWR agreed to research what has been done in the past and possibly form a technical subgroup to find an interim solution.

Next Meeting: The next DOSS conference call is scheduled for 4/16/13, at 9:00 a.m.

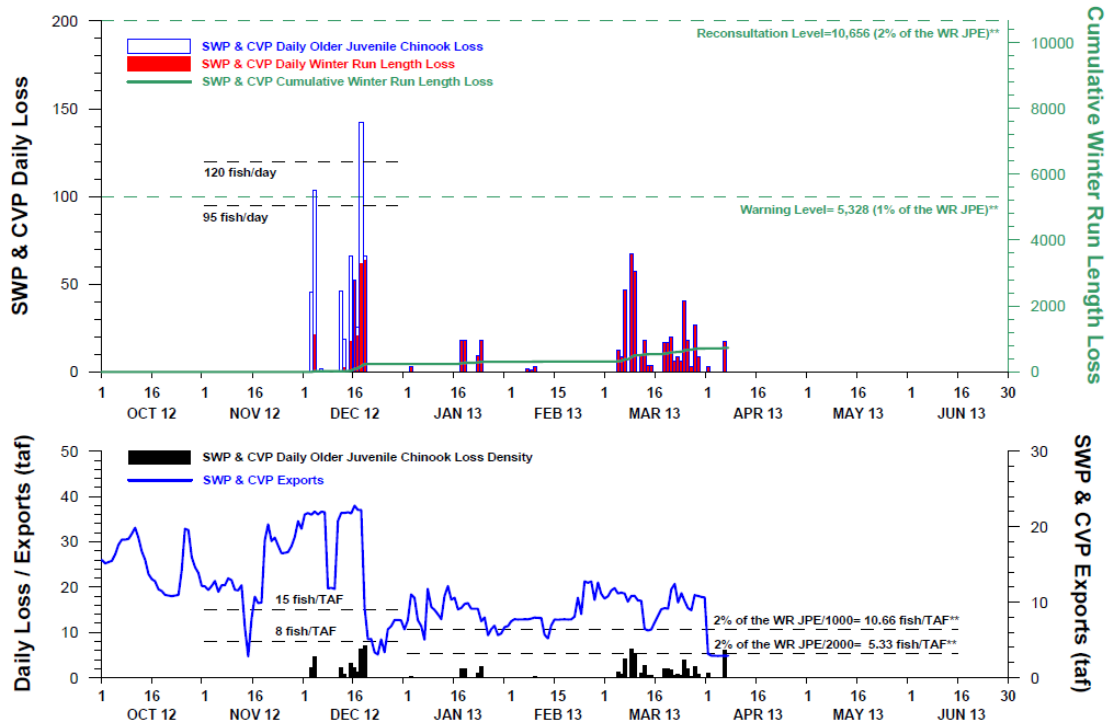
Below are graphs provided by DWR for Chinook salmon and steelhead salvaged or lost at the Delta fish facilities and observed in the Sacramento and San Joaquin rivers. For additional graphs, please visit the DWR website at: <http://www.water.ca.gov/swp/operationscontrol/calFed/calFedMonitoring.cfm>.

OBSERVED CHINOOK SALVAGE AT THE SWP & CVP DELTA FISH FACILITIES 08/01/2012 THROUGH 04/07/2013



DWR-DES 08 APR 2013
 Preliminary data from DFW, DWR, FWS, Reclamation, and CDEC; subject to revision.
 *Chinook outside of the length-at-date criteria (Delta model) are not reported.

NON-CLIPPED WINTER RUN & OLDER JUVENILE CHINOOK LOSS AT THE DELTA FISH FACILITIES 01 OCT 2012 THROUGH 07 APR 2013



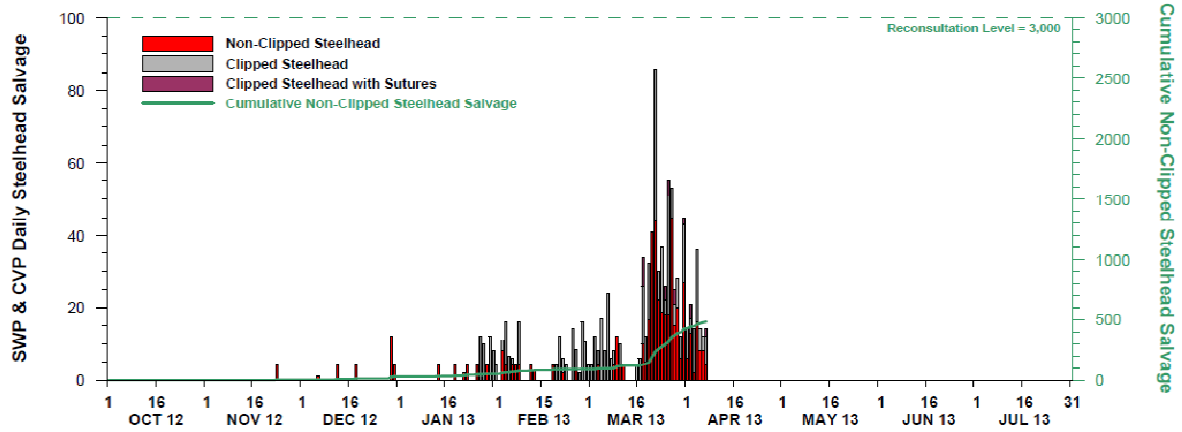
DWR-DES 08 APR 2013

Preliminary data from DFW; subject to revision.

*Older juvenile Chinook defined as all Chinook above the minimum winter run length-at-date criteria and below the maximum size included in the length-at-date criteria (Delta model).

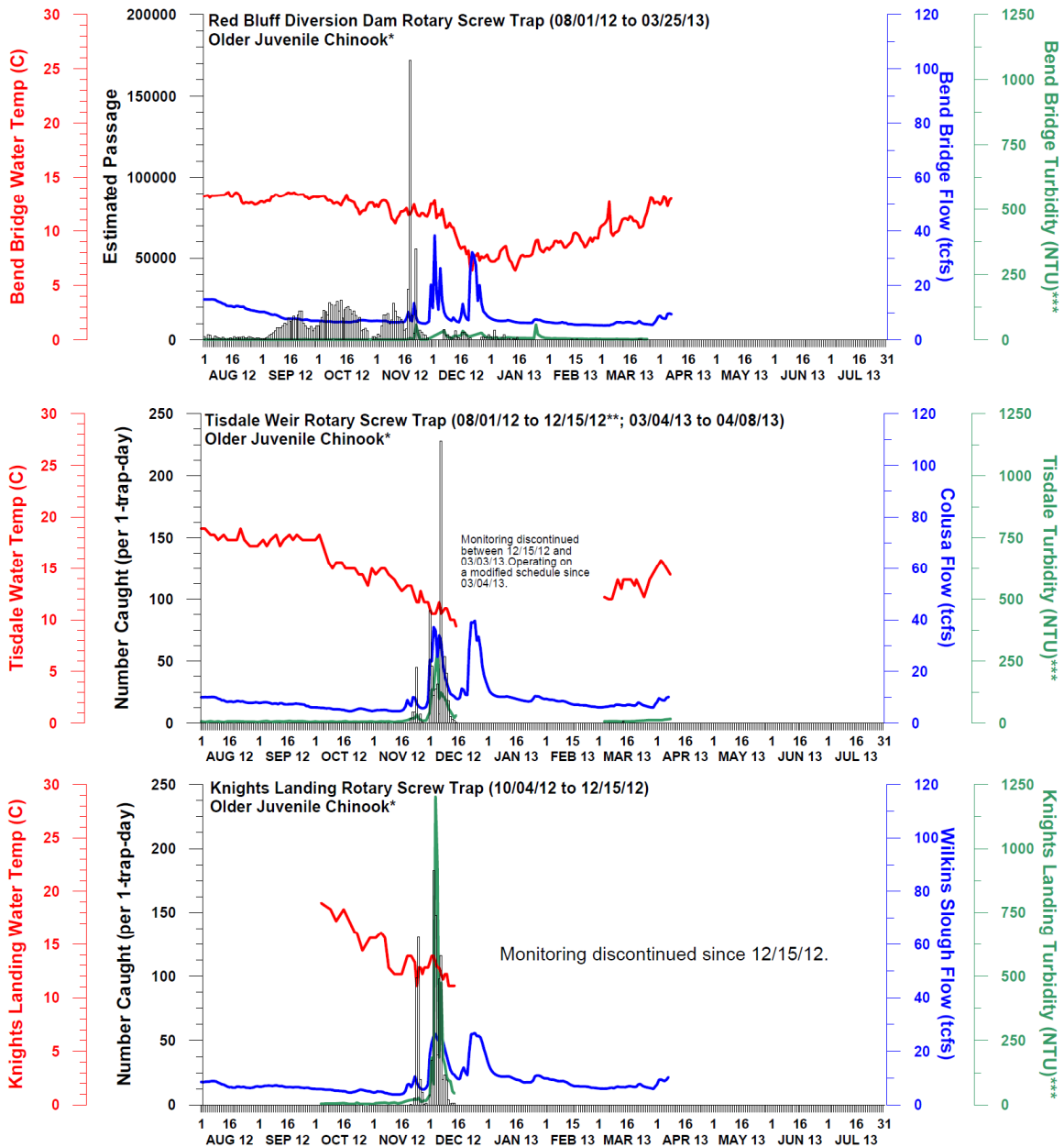
**Based on the final juvenile production estimate (JPE), which comes out to be about 532,809 non-clipped winter run (WR) Chinook entering the Delta during water year 2013.

STEELHEAD SALVAGE AT THE DELTA FISH FACILITIES 01 OCT 2012 THROUGH 07 APR 2013



DWR-DES 08 APR 2013
Preliminary data from DFW; subject to revision.

NUMBER OF OLDER JUVENILE CHINOOK MEASURED IN THE SACRAMENTO RIVER



DWR-DES 08 APR 2013

Preliminary data from DFW, FWS, and CDEC; subject to revision.

*Older juvenile Chinook defined as all Chinook above the minimum winter run length-at-date criteria and below the maximum size included in the length-at-date criteria (Frank Fisher model).

** Tisdale Weir: One older juvenile caught on 9/14 and 43 older juveniles caught on 11/25. However, CPUE was not calculated due to problems with the cone clickers. As a result, data are not presented on the graph.

***Turbidity is a discrete measurement and is not measured continuously. Therefore, data are interpolated on days when turbidity was not measured.

The figure consists of two vertically stacked charts, each with three y-axes and a shared x-axis representing time from August 2012 to July 2013.

Top Chart: Sacramento River Trawl and Area Seines

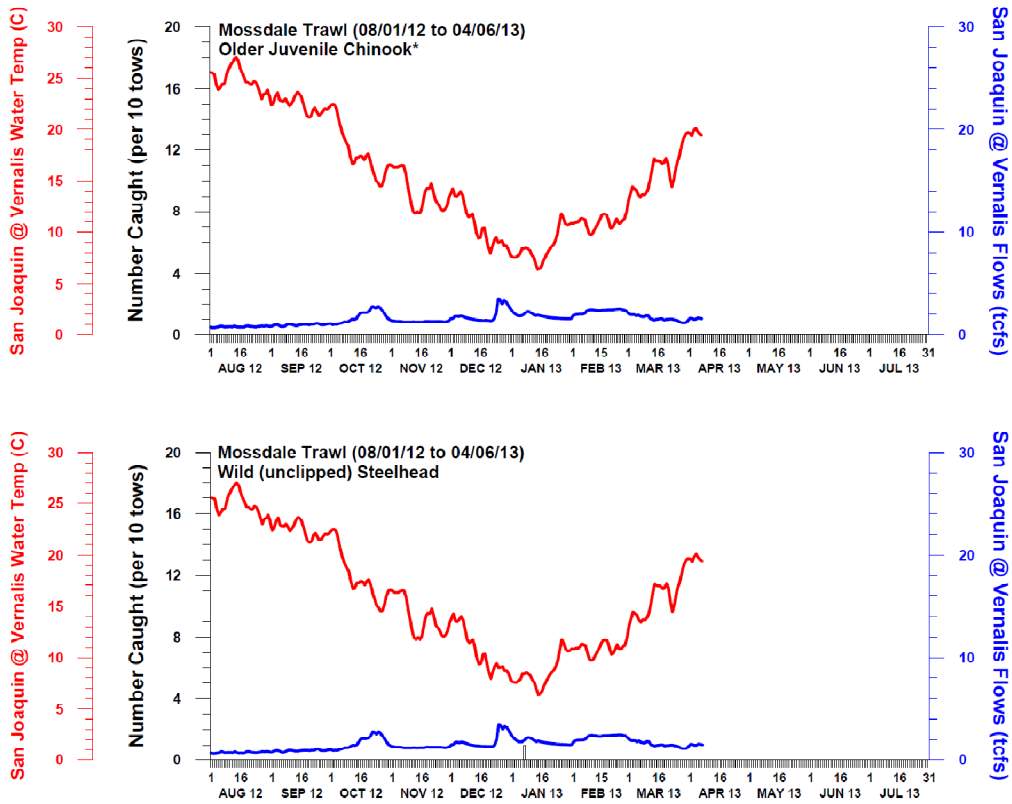
- Left Y-axis (Red):** Sacramento @ Hood Water Temp (C), ranging from 0 to 30.
- Inner Left Y-axis (Black):** Number Caught, ranging from 0 to 100.
- Right Y-axis (Blue):** Freeport Flow (tcfs), ranging from 0 to 120.
- Legend:**
 - Sacramento River Trawl (08/01/12 to 04/06/13):** Represented by a red line.
 - Sacramento Area Seines** (08/01/12 to 04/06/13):** Represented by a blue line.
 - Older Juvenile Chinook* (catch per 10 tows):** Represented by grey vertical bars.
 - Older Juvenile Chinook* (catch per 8 hauls):** Represented by black vertical bars.
- Trends:** Water temperature (red line) starts at ~20°C, peaks at ~22°C in late August, then generally declines to ~10°C by January before rising again. Freeport flow (blue line) shows a major peak of ~100 tcfs in late December. Chinook catches (grey and black bars) are concentrated between November and January, with a significant peak in late December.

Bottom Chart: Chipps Island Trawl

- Left Y-axis (Red):** Chipps Island Water Temp (C), ranging from 0 to 30.
- Inner Left Y-axis (Black):** Number Caught (per 10 tows), ranging from 0 to 100.
- Right Y-axis (Blue):** Delta Outflow (tcfs), ranging from 0 to 120.
- Legend:**
 - Chipps Island Trawl (08/01/12 to 04/06/13):** Represented by a red line.
 - Older Juvenile Chinook*:** Represented by grey vertical bars.
- Trends:** Water temperature (red line) follows a similar pattern to the top chart. Delta outflow (blue line) shows a sharp peak of ~100 tcfs in late December. Chinook catches (grey bars) are concentrated between November and January, with a significant peak in late December.

**Sacramento area seine route consists of the following seine sites: Verona, Elkhorn, Sand Cove, Discovery Park, American River, Miller Park, Sherwood Harbor, and Garcia Bend. Bars are stacked if Chinook caught from the trawl and seines are from the same day.

NUMBER OF OLDER JUVENILE CHINOOK AND STEELHEAD MEASURED IN THE SAN JOAQUIN RIVER



DWR-DES 08 APR 2013

Preliminary data from DFW, FWS, and CDEC; subject to revision.

*Older juvenile Chinook defined as all Chinook above the minimum winter run length-at-date criteria and below the maximum size included in the length-at-date criteria (Frank Fisher model).